Notes ichtyologiques / *Ichthyological notes*

First record of *Pomatoschistus marmoratus* (Gobiidae) on the Tunisian coasts

by

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RÉSUMÉ. - Premier signalement de *Pomatoschistus marmoratus* (Gobiidae) sur les côtes tunisiennes.

Onze spécimens du gobie marbré *Pomatoschistus marmoratus* (Risso, 1810), ont été pêchés sur les côtes tunisiennes. Cette capture constitue le premier signalement de l'espèce sur les côtes tunisiennes et une preuve de sa présence sur la rive sud de la Méditerranée. Ceci nous apporte de nouvelles données quant à la morphologie et l'écologie de ce poisson.

Key words. - Gobiidae - *Pomatoschistus marmoratus* - MED - Tunisia - New record - Morphology - Ecology.

The Mediterranean gobiine genus, *Pomatoschistus* Gill 1864 comprises eleven, mainly marine, species (Miller, 1986). *Pomatoschistus marmoratus* (Risso, 1810) (Fig. 1) represents one of the most abundant and dominant species in the benthic fish assemblages in the shallow and littoral areas on Mediterranean coasts (Fouda, 1995; Koutrakis *et al*., 2000; Berrebi *et al*., 2005; Pérez Ruzafa *et al*., 2006; Matić Skoko *et al*., 2007). The marbled goby is widespread throughout eastern Atlantic, Mediterranean, Black and Azov Seas and the Suez Canal, inhabiting sandy, inshore, shallow waters and sometimes brackish and hypersaline waters (Miller, 1986). Despite its wide distribution and abundance, no record has been reported on its possible finding along the southern side of the Mediterranean Sea until the present research.

MATERIAL AND METHODS

Two females, 34.7 + 6.6 mm and 32.2 + 6.6 mm, nine juveniles of unidentified sex, 25.9 + 5.0 mm - 31.8 + 6.5 mm (PMR VP1906), were caught on 18 January 2008 in El Bibans lagoon, south Tunisia (Fig. 1). Fishes were captured using a 10 m long, 1 m height and 2 mm mesh size beach trawl in the shallow brackish water. They were fixed with 10% formalin until the examination. The specimens were collected by R. Mejri and deposited in Prirodoslovni muzej Rijeka (PMR). Meristic abbreviations: A, anal fin; C, caudal fin; D1, D2, first and second dorsal fin; P, pectoral fin; V, pelvic disc; LL, scales in lateral series; TR, scales in transverse series. Terminology of lateral-line system follows Miller (1986). The part of the specimens (1 female and 5 juveniles) were stained in 2% $KMnO_4$ solution for 20 s and 0.3% H_2SO_4 solution for 20 s. The lateral line system and scales were count on these specimens. Due to the skin damage on predorsal and opercular area, oculoscapular, opercular and anterior dorsal rows were not visible in some specimens.

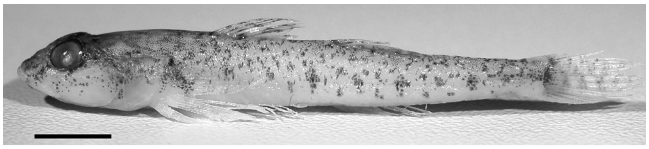

Figure 1. - *Pomatoschistus marmoratus,* female, 34.7 + 6.6 mm, PMR VP1906, Bibans lagoon, South Tunisia, 18 Jun. 2008. Scale bar = 5 mm.

RESULTS

Morphology

Diagnosis. - The specimens differ from all other species of the clofnam area and fit to *P. marmoratus* by the following combination of characters: 1) row *a* present, 2) V anterior membrane present with villose edge, 3) head with anterior and posterior oculoscapular, and preopercular canals without numerous extra pores, 4) head canals extends to snout, to paired pore σ, 5) LL scales 41-43, 6) D1 and D2 base completely scaled, 7) *b* reaching anteriorly below *a*, 8) at least 3 suborbital rows with more than 4 papillae each, 9) no double dots on lateral midline and no rows of intense dots on D fins.

Description. - Anterior nostril short, tubular, without process from rim. Branchiostegal membrane attached to entire side of isthmus. Fins: D1 VI; D2 I/8-9 (8: 4, 9: 7); A I/8-9 (8: 3, 9: 8); C 14-15 segmented rays (14: 2, 15: 9), 11-13 branched rays (11:2, 12: 5, 13: 4); P 18-20 (both sides: 18 and 18: 2, 18 and 19: 4, 19 and 19: 1, 19 and 20: 3, 20 and 20: 1), V I/5+5/I. P uppermost rays within membrane; V complete, with anterior transverse membrane. Rear edge of V anterior transverse membrane villose. C rounded. Body with ctenoid scales, LL 41-43, TR 9. Head and predorsal area naked, breast with cycloid scales in the rear part or just laterally. Colour preserved whitish. Upper part of body with reticulate pattern, formed by dark pigment along the scale margins and five more or less distinctive saddles. Five or more ill-defined marks along lateral midline, the last one on the beginning of C. Underside of body without pigmentation. Head similar to body, Y bar on chin not intensive, especially in juveniles. D1, D2 and C dotted. P upper origin pigmented, the rest of P fin transparent. A and V transparent. Head with anterior and posterior oculoscapular, and preopercular canals, with pores σ, λ, κ, α, ρ, ρ^1, ρ^2, and γ, δ, ε respectively. Rows of sensory papillae: (I) *preorbital*: longitudinal rows *r* (4-6) and *s* (4-7), transverse row s^3 (3). Lateral series *c*: superior c^2 (3-4); middle c^1 (2-4); inferior rows c_1 (5-8) and c_2 (2-4). (II) *suborbital*: infraorbital row *a* (17-20) extending forwards in front of anterior edge of pupil, single transverse row *atp* (2-5). Longitudinal row *b* (9-14) anteriorly beginning below rear border of eye. Six to seven transverse rows *c* below level of row *b*: *c1* (2-3), *c2* (3-6), *c3* (3-6), *c4* (2-7), *c5* (4-6), *c6* (0-6) and *cp* (8-12), two transverse rows below *b*, row *cp* ending below level

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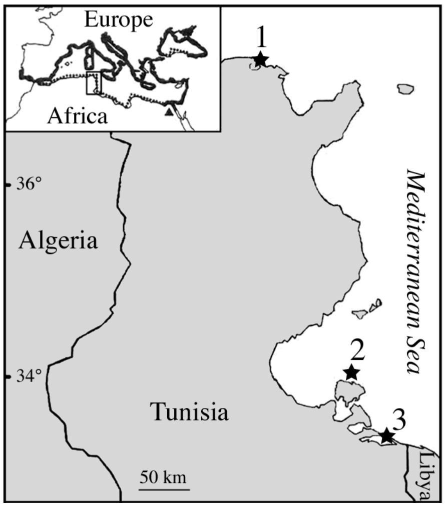

Figure 2. - Distribution of *Pomatoschistus marmoratus* in Tunisian lagoons. 1: Bizerta lagoon; 2: Lella Hadria lagoon (Jerba); 3: El Bibans lagoon (Zarzis).

of row *d*. Longitudinal row *d* separated in supralabial (6-10) and posterior part (8-13), not reaching posteriorly row *cp*. (III) *preoperculo-mandibular*: rows *e* and *i* divided into anterior (*e*: 20-27, *i:* 17-24), and posterior sections (*e*: 24-33, *i:* 18-25); mental row *f* longitudinal (3-4). (IV) *oculoscapular:* transverse row *tra* (3-4) behind and above pore α, longitudinal row x^1 divided by transverse row *trp* (5-8) in frontal part (5-8) and rear part (3-5), row *z* (4-7) behind pore γ, longitudinal row x^2 (4-6) over pore ρ^2, row *y* (1-2) behind pore ρ^2, row *q* (1-2) in front of pore ρ^1. Axillary rows: as^1 (5-7), as^2 (8-9), as^3 (8-10), la^1 (3-4) and la^2 (3). (V) *opercular*: rows *ot* (19-23), *os* (9-15), *oi* (8-9). (VI) *anterior dorsal*: row *n* (4), row *o* absent, rows *g* (6-8), *m* (4) and *h* (8-9).

Ecological and geographical distribution

Samples of small gobies belonging to *P. marmoratus* were collected in shallow (0.1-0.5 m) coastal lagoons along the Tunisian coasts (Bizerta lagoon, Lella Hadria lagoon (Jerba) and El Bibans lagoon). The position of each mainland lagoon is shown in figure 2.

The species was numerous and frequent on the researched sites and it represents the most abundant and dominant species in the shallow areas of these lagoons, except for Bizerta lagoon where only three specimens were caught. The collected specimens were present at sandy bottom and they were taken mostly from unvegetated areas during summer or autumn, except for those of Bizerta lagoon, which were captured in sandy-muddy substrata dominated by green algae of the genera *Enteromorpha* and *Ulva*, and the red algae of the genus *Gelidium*. The marbled goby, absent at low tide at the researched sites, becomes very abundant at high tide on sparsely vegetated and unvegetated sandy bottom. It seems that the species makes migrations, within the lagoon, which are controlled by the tide.

DISCUSSION

The ecological preferences, morphological description and meristic counts match well with the distinctive characters of this species (Miller, 1986) and confirm its presence along the Tunisian coasts. The researched specimens from Tunisia differ from the species description (Miller, 1986) only in absence of head canal pore ω, what was also observed in Adriatic specimens of *P. marmoratus* (Kovačić, unpubl. data).

The marbled goby *P. marmoratus* is a small-bodied fish reaching a maximum total length (TL) of 6.5 cm (Miller, 1986). It is a non-migratory euryhaline species that spends its entire life in shallow waters of coastal lagoons and estuaries (Fouda, 1995; Koutrakis *et al*., 2000). As regards the habitat occupation, it has been noted that *P. marmoratus* is generalist (Malavasi *et al*., 2005) but seems to be more abundant on sparsely vegetated and unvegetated sandy bottoms (Pérez Ruzafa *et al*., 2006) such is, in our case, both Lella Hadria and El Bibans lagoons. We have also noted that the species makes migrations controlled by the tide within the both lagoons, returning to the shallow water of the lagoon at the high tide.

This finding allow us to enhance the number of the gobiid species recorded on Tunisian coasts to eleven species. It suggests also that the distribution of this species is continuous along the Mediterranean coasts. However, more investigations must be conducted on the southern side of the Mediterranean to confirm this result. This will provide us data on the real diversity of the Gobiidae family in these areas.

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